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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/391,473 | 09/08/1999 | NOBORU KUBO | 4930(840) | 8652 |

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EDWARDS & ANGELL, LLP
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BOSTON, MA 02205

EXAMINER

WHIPKEY, JASON T

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2612

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/391,473

Applicant(s)

KUBO ET AL.

Examiner

Jason T. Whipkey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 9-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4, 6 and 9-19 is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 12, 2005, has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 1-3 and 5 have been considered but are moot in view of the new grounds of rejection.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Levine (U.S. Patent No. 4,253,120).

Regarding **claim 1**, Levine discloses a pixel defect detector for a solid-state imaging device (imager 100 in Figure 2), comprising a plurality of photoelectric transducers (picture sampling elements 206), the pixel defect detector comprising:

a calculation section (discrimination means 900 in Figure 9) for obtaining output characteristics of a subject photoelectric transducer (inputted pixel III) for arbitrary amounts of light incident thereupon (defect detection and correction are performed in real time during actual use of the camera; see column 1, lines 54-59) so as to determine the presence/absence of a defect in the subject photoelectric transducer based on the output characteristics thereof (see column 6, lines 40-44), wherein

an output corresponding to a non-defective photoelectric transducer (the output of averaging circuit 906) is calculated based on outputs from a plurality of photoelectric transducers neighboring the subject photoelectric transducer (pixels II and IV, which correspond to the pixels preceding and following pixel III; see column 7, lines 9-12) for one of the amounts of incident light without requiring specific amounts of incident light (defect detection occurs during the actual use of the camera and not in a special mode; see column 1, lines 54-59), and

the calculated output corresponding to a non-defective transducer is used in determining the presence/absence of a defect in the subject photoelectric transducer (see column 8, lines 6-8).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Levine.

Regarding **claim 2**, Levine discloses:

the pixel defect detector further comprises a memory (tapped delay line 800 in Figure 8 stores a number of pixels used in the detection of a pixel defect) for storing an output signal from the photoelectric transducer; and

the calculation section determines the output characteristics of the subject photoelectric transducer using the output signal of the subject photoelectric transducer stored in the memory (column 6, lines 28-37).

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Levine is silent with regard to specifically using a memory that can store an entire picture.

Official Notice is taken that picture memories are commonly used to hold entire images before image processing. An advantage of using such a memory is that a delay in image processing would not result in the loss of image data. For this reason, it would have been obvious at the time of invention to have Levine's defect detector store image signals in a picture memory prior to processing.

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Levine in view of Heller (U.S. Patent No. 6,396,539).

Claim 3 may be treated like claim 1. However, Levine is silent with regard to the output characteristics of the photoelectric transducer being represented by a plurality of output signals in response to different amounts of incident light.

Heller discloses:

the output characteristics of the subject photoelectric transducer are represented by a plurality of output signals of the subject photoelectric transducer in response to different amounts of light incident thereupon, respectively (see column 8, lines 8-17).

An advantage of using different amounts of light to determine photoelectric transducer output characteristics is that both white and dark defects may be detected. For this reason, it would have been obvious to one of ordinary skill in the art at the time the invention was made to

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have Levine's defect detector use a plurality of output signals to determine photoelectric transducer output characteristics.

9. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Levine in view of Contini (U.S. Patent No. 6,184,529).

Claim 5 may be treated like claim 1. However, Levine is silent with regard to using a defocused optical system for calibration.

Contini discloses a uniformity correction apparatus for an imaging system. As stated in column 2, lines 42-48, an advantage of using a defocused optical device when calibrating an imaging device is that a uniform photon flux may be cast upon the imaging device without needing a perfectly uniform illumination device. For this reason, it would have been obvious at the time of invention to have Levine include a defocused optical system, such as the one described by Contini.

Allowable Subject Matter

10. Claims 4, 6, and 9-19 are allowed.

Regarding claims 4, 6, 9, and 18, no prior art could be located that teaches or fairly suggests a pixel defect detector for a solid-state imaging device that determines coefficients a and b for the given Expression (1) using neighboring pixels and compares the coefficients with predetermined levels, wherein specific amounts of incident light are not required in the equation

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and the output of the equation is used to determine the presence/absence of a defect of a subject photoelectric transducer.

Regarding claims 10, 11, and 19, no prior art could be located that teaches or fairly suggests a pixel defect detector that sets a coefficient in the given equation to a median of the outputs of a specific set of photoelectric transducers.

Regarding claims 12-17, no prior art could be located that teaches or fairly suggests an image sensor calibration system that detects defective pixels using the given equations.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Whipkey, whose telephone number is (571) 272-7321. The examiner can normally be reached Monday through Friday from 9:00 A.M. to 5:30 P.M. eastern daylight time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thai Tran, can be reached at (571) 272-7382. The fax phone number for the organization where this application is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JTW

JTW

August 22, 2005


THAI TRAN
PRIMARY EXAMINER